

Referential Cohesion in Academic Writing

A descriptive and exploratory
theory- and corpus-based study of
the text-organizing role of reference
in written academic discourse

PhD Dissertation Summary

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1. Introduction

The past few decades have seen an enormous expansion of teaching English for academic purposes (EAP) in a wide range of disciplines. English has become the primary language for international academic communication (Hyland, 2006) and the dissemination of knowledge within and among discourse communities (Swales, 1990) around the world. Simultaneously, a growing number of studies in discourse analysis have turned towards analyzing EAP to analyze the characteristics of key genres (research articles, lectures, etc.), often with the purpose of informing the teaching of EAP.

Previous research suggests (e.g. Halliday & Hasan, 1976; de Beaugrande & Dressler, 1981; Biber, Conrad & Reppen, 2005) that the study of textual cohesion contributes to our understanding of the underlying structure and degree of interpretability of texts. Cohesive reference in particular has been shown to be very problematic for students of English as a foreign (EFL) or second language (ESL) (e.g. Trimble, 1985; Reid, 1992; Connor, 1996; Liu & Braine, 2005), and for non-native writers in general (Flowerdew, 2001). Appropriate use of reference is a highly relevant textual feature in research articles (RAs); an "above-average" use of nominal phrases in scientific RAs (Biber et al., 1991, p. 231; see also Bhatia, 1993) presupposes concise representation of relationships between basic concepts for discourse cohesion and coherence (Huckin & Olsen, 1991). Learning to produce writer-responsible, context independent texts is difficult even for native speakers. Misjudging such reader expectations resulting

in a low amount of explicit bridging between segments of the text may result in “textual incoherence” (Leki, 1991, p. 139).

Although discourse level characteristics are more technically difficult to identify and analyze than lexical and grammatical features at the text level, in many cases it turns out that “the use of many lexical and grammatical features can only be fully understood through analysis of their functions in larger discourse contexts” (Biber, Conrad & Reppen, 2005, p. 106). Among the various approaches to discourse analysis, corpus-based approaches using text analysis programs are by far the most popular nowadays, due to their efficiency in examining relatively large amounts of texts for typical and frequent features. Though tagged corpora provide syntactic information, some aspects of texts, such as cohesive reference, remain impossible to analyze using with text analysis software. What’s more, even though a number of studies (e.g. Ting, 2003; Harwood, 2005; Biber, Conrad & Reppen, 2005) suggest that cohesive reference is a central organizing element of discourse, and is particularly important in academic writing, there is no analytical tool available that could capture the complexity of reference in extended stretches of discourse. The present study intends to fill this gap.

2. Aims and methodology

The present study has three major aims:

1. to design a new framework and analytical tool for Referential Cohesion Analysis (RCA);

2. to justify the validity and reliability of the instrument for RCA through its implementation on a corpus of academic texts;
3. to explore problem areas of novice writers and identify expert strategies in the use of reference to provide an empirical foundation for teaching this aspect of academic writing.

These aims are accomplished through a series of five empirical studies focusing on piloting and refining the analytical tool used, as well as on exploring cohesive reference in academic writing.

The main question to orient the study is the following:

On the basis of the differences and similarities that can be identified in use of referential cohesion in academic writing by experts and novice Hungarian EFL writers, what pedagogical implications may be formulated for the teaching of English academic writing?

To be able to answer this question, first an analytical tool for the study of referential cohesion is devised that is exempt from the weaknesses of the analytical instruments proposed so far (i.e. Halliday & Hasan, 1976; Halliday, 1985). The second part of the dissertation then uses this instrument to first justify its reliability and validity, and then to describe the use of referential cohesion of Hungarian novice EFL writers in comparison to that of expert writers. The study ends by the discussion of pedagogical implications for the teaching of EFL and EAP writing in particular.

The study follows a mixed design approach, consisting of several methods of enquiry: quantitative, qualitative and theoretical. At each of the five stages of this research, qualitative methods are used to systematize emerging patterns during the data analysis procedure and the quantitative linguistic data analysis procedure. These two sources of data provide an input to subsequent stages of research. In addition, quantifiable corpus data will be interpreted using qualitative discourse analysis methods to ensure reliability by a meaningful, contextualized interpretation of corpus findings. This empirical procedure goes hand in hand with the reconsideration of the theoretical foundations of the analysis of reference.

3. Method

3.1 Analytical tool: referential cohesion analysis

In this study, we understand **cohesion** as the linguistic expression of connection by "overt, grammatically describable" dependencies (Enkvist, 1990, p. 14) and mutual connections of the components of the surface text (de Beaugrande & Dressler, 1981). Cohesion is assumed to contribute to **coherence**, which is a textual quality that makes a text interpretable for readers by building up and conforming to a possible and consistent world-picture (Enkvist, 1990). These covert relationships may be present in the text with or without overt linguistic connections between the elements, which may be made overt through the process of interpretation (Blum-Kulka, 1986).

In this study we define **cohesive reference** as a discourse process that occurs when certain linguistic items

cannot be interpreted in their own right, but need a grammatically and/or semantically matching presupposed element in the text or in the co-text for their interpretation as an existing textual entity. Besides, we will treat **reference as non-cohesive** when it is exophoric or the presupposed element is found within the same sentence as the referring item. A **referent** is meant here as the real world entity that a linguistic expression designates. Besides, a **referring item or element** is understood as the linguistic item that triggers the referential process by signaling identity with a **presupposed item** or **antecedent** and/or by lacking a detailed enough description for its interpretability in its own right.

What our present purpose of analyzing reference requires is a **taxonomy of reference items** that are frequent and relevant in academic writing. These items need to form a closed set, because part of the analysis is computer-based.

For this we have drawn on Halliday and Hasan's original taxonomy (1976), Biber et al.'s (1991, 2002) findings related to reference items in academic writing, and data from our present RA corpus. The list of cohesive reference items in Table 1 was used for the Referential Cohesion Analysis (RCA) conducted in this dissertation.

COHESIVE REFERENCE TYPE		REFERENCE ITEMS
Personal reference		
3 rd person pronouns	nominative	<i>he, she, it, they</i>
	accusative	<i>him, her, it, them</i>
	possessive	<i>his, hers, its, theirs</i>
Possessive determiners		<i>his, her, its, their</i> +NP
Demonstrative reference		
Adverbials of place and time		<i>here, there, then</i>
Central determiners	Definite article	<i>the</i> + NP
	Demonstrative determiners	<i>this, that</i> +NP <i>these, those</i> +NP
Comparative reference		
Pre- and postdeterminers	(functioning with central determiners)	
Quantifiers	inclusive	<i>all, both, each, every</i> +NP
	expressing quantity	<i>many, more, most, some, little, less, few, several</i> +NP
	arbitrary member	<i>either, neither</i> +NP
Semi-determiners		<i>same, other, former, latter, last, next</i> +NP
		<i>certain, such</i> +NP
Adjectives and adverbs of comparison		<i>different(ly), similar(ly), as, so</i>

Table 1. A taxonomy of cohesive reference items

3.2 Non-cohesive reference analysis

In recent research there are examples in discourse analysis for triangulation (Denzin, 1988) by relying on several approaches or taxonomies to analyze the same set of data (e.g. Todd, Khongput & Darasawang (2007)). The present analysis will use two complementary taxonomies, a cohesive and a non-cohesive one, to ensure the consistency of the data collection procedure. From the set of items in Table 1, for each

occurrence in the analyzed text we identified the category for non-cohesive items as well. On the basis of preliminary analyses, we derived five main types of non-cohesive items:

A: Sentence-internal: the item has a presupposed item or a more explicit form within the same sentence in which it occurs (e.g. *the word “how”*; *the story itself*)

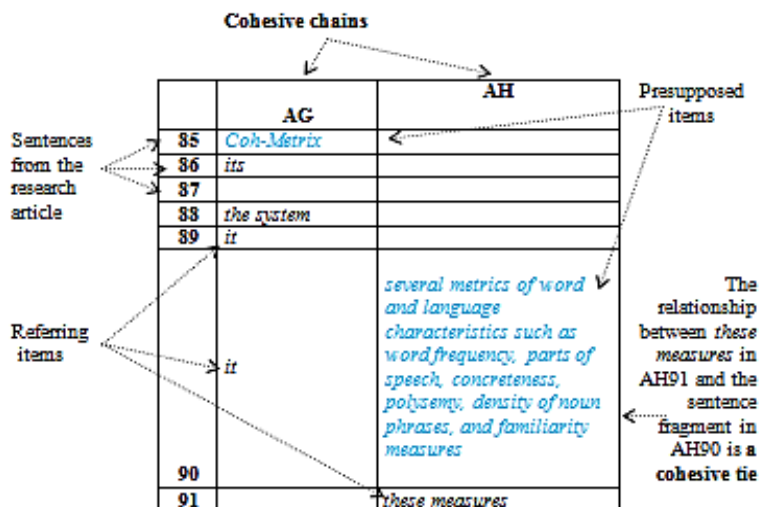
B: Specified by pre- or post-modifier: the meaning of the item is specified by a pre- or postmodifier, or a combination of postmodifiers (e.g. *the importance of syllabus knowledge, the verbs that qualify as...*)

C: Exophoric: the item refers to general entities or exophorically to something outside the text (e.g. *the reader* (meaning: *any reader*), or a unique item: *the Sun*)

D: Non-referential: the item does not have a referential property or content (e.g. existential *there*, dummy *it*)

E: Non-integral: the item does not have a referent in the analyzed text, or does not form an integral part of the text (e.g. appears in tables, figures, quotations)

The analysis thus comprises of two main parts. Figure 1 shows a sample analysis of an extract from RA 9 from the RA corpus, sentences 85-91. The table in Figure 1 shows RCA, while items crossed out in the text are non-cohesive. In the full analysis these items receive labels on the basis of a more detailed categorization of non-cohesive items.



85. *Coh-Matrix* is a computational tool ~~that~~ measures cohesion and text difficulty at various levels of language, discourse, and conceptual analysis.
 86. ~~The~~ goal of *its* designers was to improve reading comprehension in classrooms by providing a means to write better textbooks and to match textbooks to ~~the~~ intended students more appropriately (Graesser et al., 2004; Louwerse, 2004; McNamara et al., 2002).
 87. *Coh-Matrix* is an improvement over conventional readability measures because ~~it~~ provides a detailed analysis of language and cohesion features and eventually matches ~~this~~ textual information to ~~the~~ background knowledge of ~~the~~ reader (McNamara et al., 2002).
 88. ~~The~~ system integrates lexicons, pattern classifiers, part-of-speech taggers, syntactic parsers, shallow semantic interpreters, and other components ~~that~~ have been developed in ~~the~~ field of computational linguistics (Jurafsky & Martin, 2000).
 89. ~~It~~ analyzes text cohesion in several ways, including coreferential cohesion, causal cohesion, density of connectives, latent semantic analysis metrics, and syntactic complexity.
 90. For ~~the~~ purposes of comparison, ~~it~~ also includes standard readability measures such as Flesch-Kincaid Grade Level and several metrics of word and language characteristics such as word frequency, parts of speech, concreteness, polysemy, density of noun phrases, and familiarity measures (Graesser et al., 2004).
 91. Many of ~~these~~ measures parallel ~~the~~ linguistic features used to support arguments for both sides in ~~the~~ debate over using authentic or simplified texts for L2 reading.
- (RA9)

Figure 1. Sample referential cohesion analysis

Three main types of information are obtained using the proposed analytical tool:

(1) descriptive linguistic information (the usage of the types of cohesive or non-cohesive referring elements in the corpus),

(2) discoursal features (characteristics of cohesive ties and chains in the analyzed texts) and

(3) genre-specific information (for example, the distribution of cohesive chains within the subsections of the texts analyzed).

3.3 Error analysis

Undertaking an analysis of students' written assignments necessitates a systematic approach to tackling learner errors. Contrary to our expectations, error analysis is unfortunately rarely combined with cohesion analysis (Ting, 2003). Therefore, one of the major outcomes of the present study is the taxonomy of learners' reference errors in English academic writing based on the qualitative, sentence-by-sentence cohesive and non-cohesive reference analysis of the MA thesis corpus. The main categories are summarized in Figure 2 below. The labels represent types of errors for which we found at least 20 instances in the corpus of 20 MA theses.

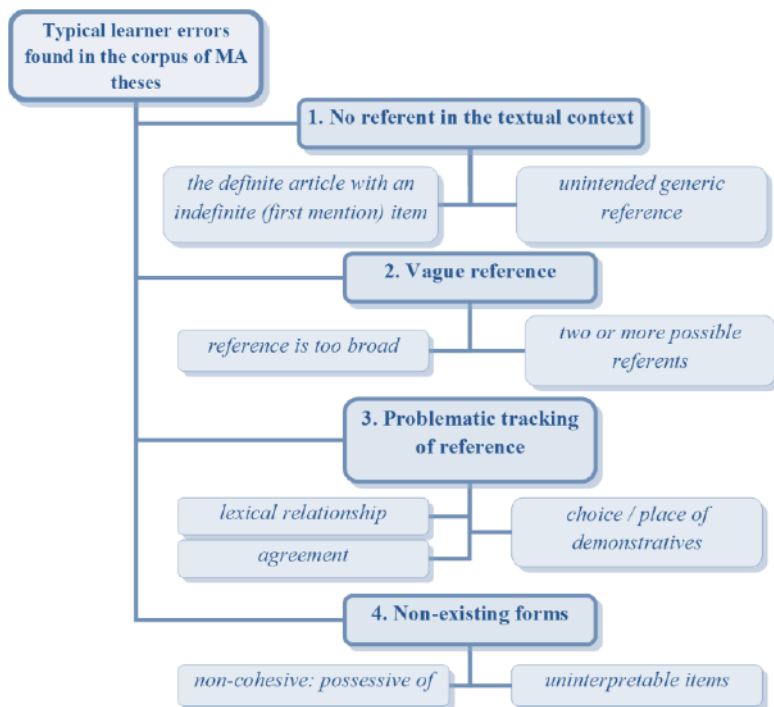


Figure 2. A taxonomy of errors in the use of cohesive reference in MA theses

4. Research stages, questions and corpora

Table 2 summarizes the research questions for the five small scale studies that contributed to achieving the three main aims of the research (stated in Section 2). There are two sets of questions for each stage, the first relating to designing and validating the RCA instrument; and another concerned with the pedagogical aim of this research (to explore the characteristics of referential cohesion in written academic discourse and highlight problem areas for students).

Research questions			
	<i>for the design and validation of the analytical tool</i>	DATA SOURCES	<i>for exploring reference in written academic discourse</i>
Stage 1 (2007 spring)	Is Halliday and Hasan's (1976) taxonomy a valid and reliable instrument for identifying cohesive ties of reference? In what ways – if any – could the taxonomy be improved?	10 RA abstracts	What are the most frequent types of referential cohesive ties in the abstracts of English research articles and what are their characteristics as regards their use?
Stage 2 (2007 autumn)	In what ways is Referential Cohesion Analysis similar to or different from the originally proposed application of Halliday and Hasan (1976) taxonomy? More specifically: How does this modification of the analytical procedures affect the construct of referential cohesion?	10 RAs	What genre characteristics of research articles can be identified on the basis of the proposed (quantitative and qualitative) analysis of this corpus as regards the types of referring items, the cohesive ties they typically establish, and the patterns and distribution of cohesive chains of reference?
Stage 3 (2007 winter- 2008 winter)	Does the addition of the taxonomy of non-cohesive items improve the validity and reliability of Referential Cohesion Analysis?	10 RAs and 10 MA theses	What similarities and differences are there between the two corpora of 10 RAs and 10 MA theses in terms of their use of referring items?
Stage 4 (2009- summer- winter)	What main error types emerge in the Referential Cohesion Analysis of MA theses? In what ways do these errors affect the comprehensibility of the texts?	10 higher and 10 lower rated MA theses	What are the most typical errors in the use of cohesive items in high- and low-rated theses? What are the most problematic text parts (e.g.: <i>Introduction</i> , <i>Methods</i>) for novice writers?
Stage 5 (2011 summer- winter)	Is the proposed tool for Referential Cohesion Analysis a valid and reliable instrument for describing cohesive ties of reference in academic discourse? What referential characteristics of texts is it capable of describing?	20 RAs and 20 MA theses	What writing techniques or patterns of reference do expert writers employ to overcome problems in the use of reference encountered in student theses?

Table 2. Research questions and corpora at the five stages of research

The expansion of the corpus can be traced under the heading “*data sources*” in Table 2. **The total corpus** of 20 RAs and 20 MA theses was gradually built, and we approached each set from different perspectives at the five steps of the construction of the analytical tool.

RAs and MA theses were collected on the basis of the following selection criteria:

- written since the year 2000 (in order to make sure that neither language change, nor major changes in editorial requirements affect the language used in the RAs);
- presenting the results of some empirical research;
- from the field of applied linguistics (in order to make the corpus representative of this field, care was taken to include articles of varying length from a range of topics within applied linguistics, such as: education, education technology, language technology, psycholinguistics, discourse analysis and second language acquisition).

These MA theses were made available from the *Hungarian Corpus of Learner English* (Károly & Tankó, 2009). The corpus of theses in this paper contains papers written in Applied Linguistics by English major students.

5. Summary of results

5.1 Theoretical outcome: an analytical tool for the study of reference as a cohesive device

The data gathered in this dissertation study revealed that every single aspect of cohesive reference would deserve more attention and more discussion as there is a lot more yet to be learned about the phenomenon of reference. A major outcome of this dissertation is the development of a valid and reliable description of cohesive reference in academic writing by a

multi-faceted RCA tool. This study offers a novel approach to analyzing reference by revising Halliday and Hasan's (1976) taxonomy and proposing an analytical tool that is capable of capturing non-linear patterns of cohesion through larger stretches of text than was earlier possible. This way, the analysis can describe cohesive relationships that caused ambiguities and analytical problems in Halliday and Hasan's (1976) framework. Being the only existing analytical tool for discourse-level referential cohesion analysis, RCA can be a springboard for further studies in this field.

5.2 Methodological outcome

Probably the most important outcome of this dissertation study is that it transforms the part of Halliday and Hasan's (1976) cohesion framework dealing with reference into an analytical device that enables both researchers and less trained users (e.g. teachers or students) to carry out reference analysis on larger stretches of texts, depicting even complex, non-linear relationships between cohesive chains. RCA done by students may aid the development of discourse competence considerably. Without too much loss on the theoretical side, the functional capacity of the analytical tool is multiplied by providing a flexible and transparent method to display cohesive reference chains. As a consequence, it provides a methodological background for an easier cohesion analysis for various purposes: discourse analysis, teaching or even as a basis of future text analysis software.

5.3 Empirical outcome: the referential characteristics of research articles and MA theses

As a result of the referential cohesion analysis of the corpus of 20 RAs, 10 high and 10 low rated MA theses, some interesting outcomes of the reference analysis (based on normalized data) are highlighted here:

(1) Descriptive linguistic information

Out of the total number of reference items, RAs had the lowest number of cohesive items (29%), followed by high rated theses (37%), and low rated ones with the highest ratio (42%), which means that RAs are lexically denser and rely less on reader inference of cohesive relationships

(2) Discourse features

As regards the number of cohesive ties, more were found in the MA thesis corpus (avg. 37) than in the RA corpus (avg. 43); though they formed more chains in the theses. This means that MA theses contained more short chains (consisting of 2-5 cohesive ties).

An in-depth analysis of the presupposed items (or main referents) of the 10 longest chains in RAs, showed that out of the referents of the 8 longest chains in each RA, on average, 6 were already present in the abstract.

(3) Genre-specific information (for example, the distribution of cohesive chains within the subsections of the texts analyzed).

The most problematic text part in high rated MA theses is the *Review of the Literature*, with the majority of errors due to the lack of presupposed items in the text (in other words, over-reliance of the reader's familiarity with the literature and the MA thesis research conducted). In low rated MA theses it is

the *Results and Discussion* section, with many vague items, problematic demonstratives and lexical items

Based on a comparison of extended and new chains we found that while MA theses have double the space to explain their *Methods*, and that they had about five times as much space to establish a theoretical background, they do not rely on that background so much in describing the methods as RAs.

In general, the early introduction of the main referents of a research paper and consistent reference to them establishes long chains of reference with a steadily increasing number of extended chains. MA theses, especially low rated theses lack a specific introduction of these referents and have an unexpectedly high number of new chains even in the *Conclusions*.

5.4 Pedagogical outcome

This comparative analysis of Hungarian student academic writing to English expert writing contributes to research in written discourse analysis and applied linguistics by providing data concerning Hungarian advanced learners' difficulties using reference as a cohesive device, and by discussing pedagogical implications on the basis of how experts realize functions in writing that seem problematic for Hungarian learners.

By providing an analytical tool that is easy to apply for in-class text analysis, the present study may support teaching and learning EAP by raising consciousness of typical text structures and the use of referring items, which in turn will facilitate reflection on the writing process. The study has several practical pedagogical implications: it defines and classifies typical reference errors and problem areas in the

referential structure of student papers, and by doing so, it provides a basis for awareness raising and task design for EFL, EAP and discourse analysis courses.

6. Limitations

The study is limited by its focus on one particular mode of discourse and one given genre in the field of academic writing. Nevertheless; the conclusions drawn based on our data can be transferred to other academic texts. Further valuable insights could be gained from analyzing different text types as indicated by the substantially different referential structure of the theoretical papers and case studies that were eliminated from the corpus of MA thesis papers in order to ensure a meaningful and more reliable comparison of the corpus to empirical RAs.

Another obvious limitation of this study is that it does not cover the whole phenomenon of cohesion, but is restricted to referential cohesion only. Concerning the review of the types of reference, reference chains and errors we have already pointed to the problematic discussion of reference in isolation. It became clear that the notion of reference chains cannot be fully covered without the other forms of cohesion, and that the arbitrary exclusion of ellipsis (especially that of nominal elements) or lexical cohesion (exact repetition in particular) may distort the underlying patterns of referential chains we would like to discover. The method for referential cohesion analysis presented in this dissertation easily lends itself to the inclusion of lexical repetition or ellipsis in much the same way as reference is analysed.

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Jenei Gabriella's
List of publications and presentations
related to the PhD dissertation

- Jenei G. (2010). Problems in the use of reference as a cohesive device in Hungarian EFL learners' MA theses. In: Frank T. & Károly K. (Eds.). *Gateways to English. Current Hungarian Doctoral Research* (pp. 289-308), Budapest: Eötvös University Press.
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